

**SPILLS ACTION CENTRE**  
**SUMMARY REPORT OF 1994**  
**SPILLS**

**NOVEMBER 1995**



**Ministry of  
Environment  
and Energy**



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**SUMMARY REPORT OF 1994 SPILLS**

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## ABSTRACT

The Ontario Ministry of Environment and Energy's Spills Action Centre receives and initiates responses to reports of spills and other urgent environmental incidents on a 24-hour per day basis. This report provides a summarized review of spills reported to the Ministry during the calendar year of 1994, and compares this information to that obtained in previous years.

The Spills Action Centre documented 13 529 occurrences in 1994. Spills accounted for 5 007 of these occurrences; the remainder included a combination of Ministry-required notifications (other than spills), and environmental complaints from the general public.

The number of spills reported to the Ministry in 1994 increased by 3 percent from 1993. This is the first increase in the number of reported spills since 1989. The number of spills to water and spills to air accounted for some of this increase while the number of spills to land remained virtually unchanged.

Oils and fuels accounted for 55 percent of spilled materials; chemicals and chemical solutions accounted for 17 percent; wastes and waste waters 18 percent; gaseous emissions 6 percent; while other and unknown materials accounted for the remaining 4 percent. A large proportion of the reported spills involved small volumes. Cumulatively, 20 percent of the spilled materials involved volumes less than 10 litres; 55 percent were less than 100 litres; and 86 percent were less than 1 000 litres.

All occurrences reported to the Ministry, including spills, are documented on a computerized database management system called the Occurrence Report Information System (ORIS). The information stored on this system is used to assist the Ministry and others, such as Environment Canada and the International Joint Commission on the Great Lakes, in identifying and evaluating environmental concerns.



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## EXECUTIVE SUMMARY

The Ontario Ministry of Environment and Energy's Spills Action Centre receives and initiates responses to reports of spills and other urgent environmental incidents on a 24-hour per day basis. This report provides a summarized review of spills reported to the Ministry during the calendar year of 1994, and compares this information to that obtained in previous years.

The Spills Action Centre documented 13 529 occurrences in 1994. Spills accounted for 5 007 of these occurrences; the remainder included a combination of Ministry-required notifications (other than spills), and environmental complaints from the general public.

The number of spills reported to the Ministry in 1994 increased by 3 percent from 1993. This is the first increase in the number of reported spills since 1989. The number of spills to water and spills to air accounted for some of this increase while the number of spills to land remained virtually unchanged.

Oils and fuels accounted for 55 percent of spilled materials; chemicals and chemical solutions accounted for 17 percent; wastes and waste waters 18 percent; gaseous emissions 6 percent; while other and unknown materials accounted for the remaining 4 percent. A large proportion of the reported spills involved small volumes. Cumulatively, 20 percent of the spilled materials involved volumes less than 10 litres; 55 percent were less than 100 litres; and 86 percent were less than 1 000 litres.

About 18 percent of the spills had a confirmed environmental impact identified. Two-thirds of these involved soil contamination, and less than one-fifth involved water pollution. Eight spills were reported to have confirmed human health and safety concerns.

Five industrial sectors accounted for the majority of reported spills in 1994: transportation accounted for 18 percent; petroleum for 10 percent; metallurgical for 7 percent; general manufacturing for 6 percent; and, chemical for 4 percent. Public sector spills, including spills from electric utilities and sewage utilities, accounted for 18 percent of reported spills. Motor vehicles were the largest source of spills, accounting for more than 26 percent of reported spills. Spills from manufacturing and processing facilities accounted for 21 percent.

In 1994, 1 217 spills were either entirely or partially discharged to watercourses. Of these, 164 involved oil or chemical spills to the Great Lakes system, including: 51 to Lake Ontario, 24 to the St. Lawrence River, 22 to Lake Huron, 22 to the St. Clair River, 16 to Lake Erie, and 10 to Lake Superior. The remaining 19 spills were discharges to the Detroit River, St. Marys River, Niagara River, and Welland Canal. Overall there were 2 more spills to the Great Lakes system in 1994 as compared to 1993.

All occurrences reported to the Ministry, including spills, are documented on a computerized database management system called the Occurrence Report Information System (ORIS). The information stored on this system is used to assist the Ministry and others, such as Environment Canada and the International Joint Commission on the Great Lakes, in identifying and evaluating environmental concerns.

Using this type of information, the Ministry develops and modifies pollution abatement programs and spill prevention initiatives as trends or concerns are identified. The Ministry is currently working with Environment Canada under the *Canada Ontario Agreements* to prevent and control spills by improving federal and provincial spill prevention, preparedness, and response programs in priority areas across the province (such as the St. Clair River). Five educational workshops will be presented to industrial and municipal groups in these priority areas to promote awareness of the environmental consequences of spills. In addition, the Ministry is investigating the feasibility of a one-window approach to federal and provincial spill reporting.

The Ministry is actively involved in planning for spill contingencies. The Ministry's Contingency Planning Program provides advice and assistance to industry and other government agencies that respond to spills. The Ministry is responsible for maintaining the *Province of Ontario Contingency Plan for Spills of Oil and other Hazardous Materials* which provides a mechanism to deal with major spills under provincial jurisdiction.

## INTRODUCTION

This report is the seventh annual summary of occurrences reported to the Ontario Ministry of Environment and Energy's Spills Action Centre. The purpose of this report is to provide a summarized review of spills reported to the Ministry during the calendar year of 1994 and to compare this information to that obtained in previous years.

### Ontario's Spills Legislation

The Environmental Protection Act (EP Act) defines a spill, with reference to a pollutant, as:

"...a discharge into the natural environment, from or out of a structure, vehicle or other container, and that is abnormal in quantity or quality in light of all the circumstances of the discharge." (Part X, Section 91(1)).

A spill is reportable if it causes or is likely to cause an adverse effect, such as injury or damage to property or to plant or animal life, harm or material discomfort to any person. The person who had control of the pollutant immediately prior to the spill and the person who spills, causes, or permits the spill must report the discharge to the Ministry based on their determination of the likelihood of adverse effects.<sup>1</sup>

Part X of the EP Act establishes:

- the requirement to immediately notify the Ministry, the municipality in which the spill occurred and, in some cases, the owner of the pollutant and the person in control (if they are not already aware of the spill);
- the duty to clean up spills;
- the right for municipalities to respond to spills and to recover costs;
- a process, as a last resort, for the Minister of Environment and Energy to direct Ministry staff or to order the discharger or anyone else to respond to the spills;
- the right to compensation for costs and damages incurred; and,
- the Environmental Compensation Corporation to provide limited assistance in compensating certain victims of spills.

### The Spills Action Centre

The Spills Action Centre (SAC) began operations on November 29, 1985, the same day that Part X of the EP Act came into force. The primary role of the SAC is to receive and initiate response to reports of spills and other urgent environmental matters on a 24-hour per day basis. The Ministry's province-wide,

<sup>1</sup> Refer to Appendix IV for a summary of adverse effects and the reporting exemptions.

toll-free number (1-800-268-6060) is used by industry, response agencies, and the public. As this telephone number has become better known, it has been used increasingly for a variety of other environmental matters including a range of ministry-required notifications (other than spills), in addition to environmental complaints from the general public. The SAC is also responsible for the Ministry's Contingency Planning Program, maintaining the Province of Ontario Contingency Plan for Spills of Oil and other Hazardous Materials, and promoting and reviewing the development of industrial and municipal spill contingency plans.

Environmental Officers at the SAC evaluate all reported occurrences and decide what type of response is necessary. This may include any combination of the following:

- Providing immediate advice and direction to the person who reports an occurrence;
- Contacting suspected pollution sources in an attempt to verify and resolve the problem;
- Contacting other agencies or potentially affected parties as needed, for example, police, fire departments, municipal authorities, health officials, Canadian Coast Guard, US authorities, downstream water users, etc.;
- Contacting local Ministry of Environment and Energy (MOEE) personnel to initiate a field response;
- Notifying senior MOEE management and coordinating Minister's orders or directions when necessary;
- Maintaining liaison with the agencies in charge of public safety in an emergency and coordinating MOEE's support for their efforts;
- Providing information on chemicals and cleanup techniques, either directly or through CANUTEC, Transport Canada's national 24-hour centre.

## The Occurrence Report Information System

All occurrences reported to the Ministry are recorded on a computerized database management system called the Occurrence Report Information System (ORIS). This system enables the Ministry to track the status of occurrences, and facilitates the preparation of data summaries. Each occurrence report consists of a text summary of the incident and several coded fields which simplify data retrieval. A sample occurrence report is included in Appendix I of this report.

Initial information on spills and emergencies is often incomplete and may change as more information becomes available. Since some incidents take a long time to resolve, the information presented in this report is a "snapshot" of the information that existed on ORIS at the time summaries were generated (April, 1995). However, it is expected that any changes to the information on ORIS will not have a significant effect on the summaries presented in this report.

## SPILLS – 1994 SUMMARY

This part of the report summarizes the number and type of spills reported to the Ministry of Environment and Energy during 1994. The report compares this information to the data from previous years.

### Yearly Spill Totals

Between 1988 and 1990, the number of reported spills increased by 18 percent, rising from 4 072 in 1988 to 5 686 in 1990. Between 1991 and 1993, the number of reported spills decreased by more than 15 percent, falling to 4 841 in 1993. In 1994, there were 5 007 spills reported, an increase of 3 percent since 1993. *Figure 1* depicts the change in the number of reported spills from 1988 to 1994.

### Spills To Land, Water, and Air

In 1994 there were 3 161 spills to land, 920 spills to water, and 412 spills to air. Spills which affected a combination of these media accounted for an additional 514 spills. Spills to land accounted for 63 percent of all spills; spills to water accounted for 18 percent; spills to air accounted for 8 percent; and spills to multiple-media accounted for 10 percent. *Table 1* shows the number of spills and the affected media; *Figure 2* shows the relative percentages of these spills.

**TABLE 1**  
**Spills By Receiving Medium – 1988 to 1994**

MEDIUM	YEAR						
	1994	1993	1992	1991	1990	1989	1988
Land	3 161	3 222	3 194	3 117	3 144	2 996	2 261
Land & Water	430	390	475	524	467	355	243
Water	920	801	965	1 050	1 305	1 135	969
Water & Air	8	15	13	18	23	8	5
Air	412	345	311	447	649	776	543
Air & Land	76	68	56	81	98	75	51
<b>TOTAL</b>	<b>5 007</b>	<b>4 841</b>	<b>5 014</b>	<b>5 237</b>	<b>5 686</b>	<b>5 345</b>	<b>4 072</b>

### Spills By Municipal Location

Generally, municipalities with the largest population have the greatest number of reported spills. Evidence for this can be seen in municipalities such as Peel Region and York Region which, as their populations have increased, have had a corresponding increase in the number of reported spills. Due to the concentration of industrial activities, some municipalities, such as Lambton County and Hamilton-Wentworth Region, have a proportionately higher number of spills occur within their boundaries. *Table 2* shows the number of spills that occurred within each upper-tier municipality in 1994 and previous years.

Figure 1  
Reported Spills - 1988 to 1994

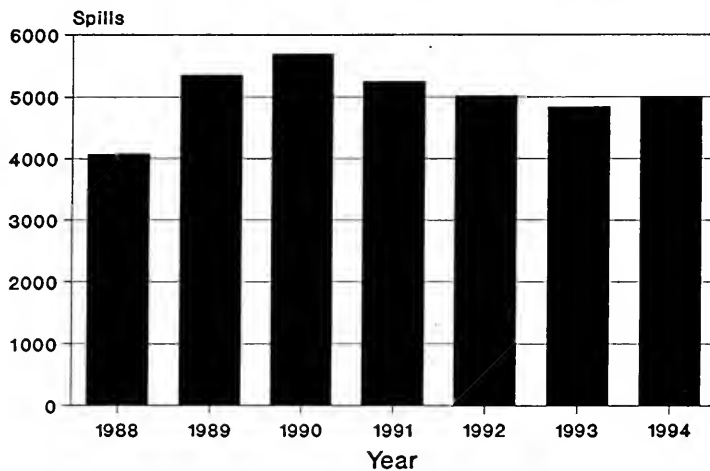
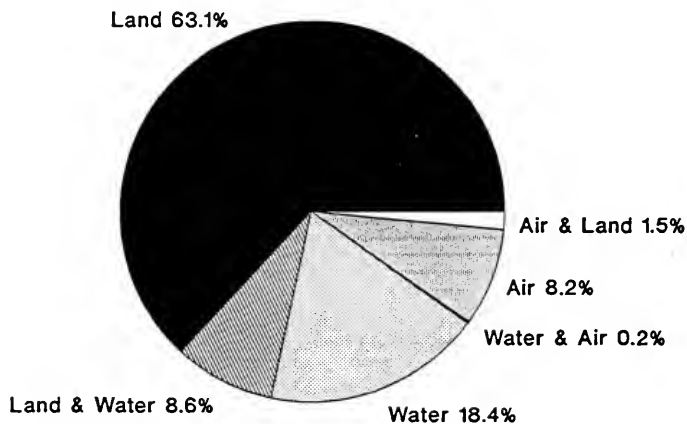


Figure 2  
Spills By Receiving Medium



**TABLE 2**  
**Spills By Municipal Location**

MUNICIPALITY	YEAR			
	1994	1993	1992	1991
Metropolitan Toronto	495	495	529	559
Hamilton-Wentworth R.M.	328	290	355	498
Peel R.M.	282	242	218	192
Niagara R.M.	244	247	233	302
Thunder Bay District	235	239	188	207
Ottawa-Carleton R.M.	215	266	232	218
York R.M.	185	176	179	153
Sudbury R.M.	181	181	202	124
Haldimand-Norfolk R.M.	173	122	116	152
Simcoe County	172	138	148	129
Durham R.M.	155	125	150	141
Waterloo R.M.	154	127	132	135
Stormont, Dundas & Glengarry County	143	112	131	162
Lambton County	135	150	177	236
Middlesex County	130	82	91	96
Halton R.M.	127	111	130	130
Algoma District	113	85	111	169
Essex County	101	88	79	83
Leeds & Grenville County	100	126	132	138
Cochrane District	88	84	95	104
Kenora District	79	99	84	71
Nipissing District	78	85	77	86
Hastings County	70	77	80	93
Kent County	67	53	43	53
Muskoka D.M.	66	68	70	38
Northumberland County	64	41	56	54
Wellington County	62	78	83	62
Timiskaming District	62	51	36	46
Renfrew County	62	78	97	65
Frontenac County	60	62	62	65
Parry Sound District	45	47	55	40
Grey County	45	52	42	48
Bruce County	45	64	62	49
Brant County	44	32	46	50
Peterborough County	41	53	68	71
Prescott & Russell County	38	37	44	35
Lennox & Addington County	37	31	31	27
Lanark County	37	36	35	39
Oxford County	36	39	36	53
Huron County	35	37	45	35
Sudbury District	31	57	46	48
Perth County	28	22	22	35
Elgin County	26	28	28	31
Rainy River District	25	43	35	26
Victoria County	20	27	36	42
Prince Edward County	15	10	19	15
Haliburton County	13	13	16	6
Dufferin County	12	20	21	15
Manitoulin District	5	11	9	9
Out-of-Province	3	4	2	4
<b>TOTALS</b>	<b>5007</b>	<b>4841</b>	<b>5014</b>	<b>5239</b>

## Types and Volumes of Materials Spilled

The 5 007 spills reported in 1994 involved a total of 5 176 spilled materials. The total number of materials spilled exceeds the total number of reported spills because a number of spills involved more than one material.

For purposes of this summary, materials are divided into five groups: oils, chemicals, gases, wastes, and other materials. *Table 3* compares the number of spills by material group and year. *Figures 3* shows the percentage of spills by material group. *Figure 4* shows the number of spills by material group and volume.

**TABLE 3**  
**Spills By Material Group**

MATERIAL GROUP	YEAR						
	1994	1993	1992	1991	1990	1989	1988
Oils	2 848	2 852	3 060	2 965	3 144	2 831	2 136
Chemicals	871	864	784	982	1 031	1 118	798
Gases	325	305	326	472	717	864	546
Wastes	931	865	942	948	1 032	763	602
Other	135	66	65	92	30	32	24
Unknown	66	43	34	32	37	81	96
<b>TOTALS</b>	<b>5 176</b>	<b>4 995</b>	<b>5 211</b>	<b>5 491</b>	<b>5 991</b>	<b>5 689</b>	<b>4 202</b>

*Table 4* shows material groups summarized by the volume spilled. A large portion of reported spills involved small volumes. Cumulatively (where quantities were known), 20 percent of the spills involved volumes of less than 10 litres; 55 percent involved volumes less than 100 litres; 86 percent involved volumes less than 1 000 litres; and 95 percent involved volumes less than 10 000 litres. These figures are indicative of a continuing trend by industry and others to report small volume spills, some of which have a reporting exemption and/or are not likely to cause adverse effects.<sup>2</sup> *Figure 4* illustrates this distribution for the three major material categories - oils, chemicals, and wastes.

**TABLE 4**  
**Spills By Material Group And Volume**

MATERIAL GROUP	VOLUME (Litres)						
	0 to 10	10 to 100	100 to 1 000	1 000 to 10 000	10 000 to 100 000	More than 100 000	Unknown
Oils	448	866	716	90	13	1	714
Chemicals	156	194	170	94	10	4	243
Gases	5	19	19	8	3	4	267
Wastes	34	68	81	99	62	55	532
Other	1	7	15	18	12	1	81
Unknown	2	3	4	1	1		55
<b>TOTALS</b>	<b>646</b>	<b>1 157</b>	<b>1 005</b>	<b>310</b>	<b>101</b>	<b>65</b>	<b>1 892</b>

<sup>2</sup> Refer to Appendix IV for a summary of the exemptions.



Figure 3  
Spills By Material Group

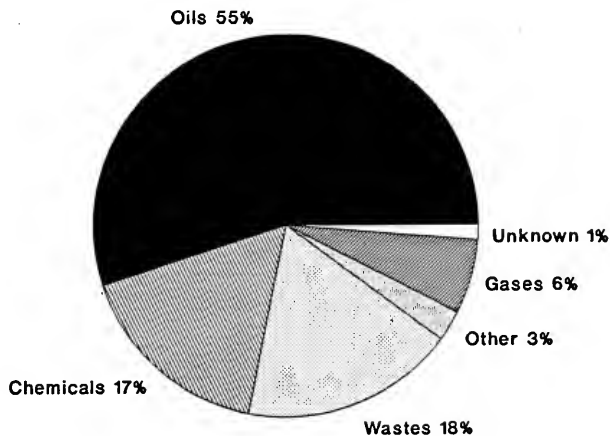
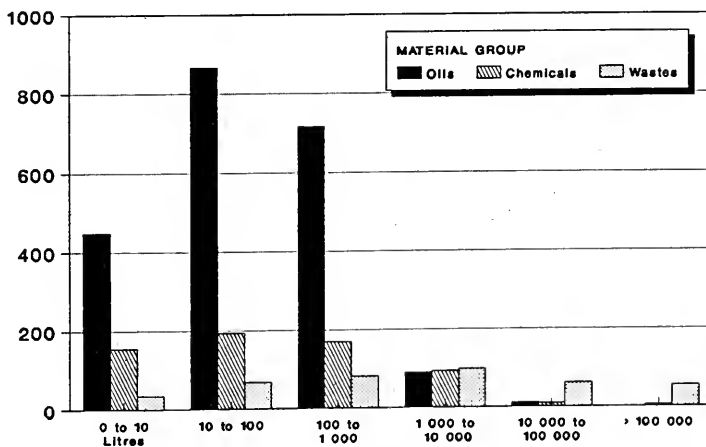


Figure 4  
Spills By Material Group and Volume



Volume was unknown for 1 489 Spills  
Involving these materials.

## Oils

In 1994, 2 848 of the materials spilled were oils, accounting for 55 percent of all spilled materials. Many of these spills involved operating fuels that spilled as a result of transportation accidents, and fuel leaks from fixed storage facilities.

About 75 percent of all oil spills had a reported volume. Cumulatively, 21 percent of these spills were less than 10 litres each, 62 percent were less than 100 litres, and 95 percent were less than 1 000 litres. As the data in *Table 4* shows, spills of oils involving volumes between 10 and 100 litres was the single largest grouping, accounting for 26 percent of all spilled materials (where the volume spilled was known). The second largest grouping was spills of oils involving volumes between 100 and 1 000 litres. Many of these spills were discharges from motor vehicle fuel tanks and residential furnace oil storage tanks.

## Chemicals

In 1994, 871 of the materials spilled were chemicals. This accounts for 17 percent of all spilled materials.

About 72 percent of all chemical spills had a volume reported. Cumulatively, 25 percent of these spills were less than 10 litres each, 56 percent were less than 100 litres, and 83 percent were less than 1 000 litres.

## Gases

In 1994, 325 of the materials spilled were in gaseous form. This accounts for 6 percent of all spilled materials. It is difficult to quantify the volume of gas emitted to air in a spill; few such reports contain volume information. In 1994, only 25 percent of the gaseous spills had a known volume.

## Wastes

In 1994, 931 of the materials spilled were wastes. This accounts for 18 percent of all spilled materials. This category includes materials that were considered wastes prior to the spill. They may have originated as byproducts of industrial processes or may involve unusually high concentrations of pollutants in otherwise normal wastewater discharges.

About 43 percent of all waste spills were of a known volume. Cumulatively, 9 percent of these spills were less than 10 litres each, 26 percent were less than 100 litres, 46 percent were less than 1 000 litres, 71 percent were less than 10 000 litres, and 86 percent were less than 100 000 litres.

A relatively higher percentage of waste spills (as compared to the oil and chemical categories) involved volumes larger than 1 000 litres. Spills involving wastes often involve large volumes because this category includes wastewater discharges wherein the material of concern may constitute a relatively small portion of the total volume spilled.

**Other Materials**

Spills of other materials, not included in the four groups mentioned above, accounted for 2 percent of all spilled materials. Fewer than 1 percent of all spilled materials were not indentified and were documented as unknown.

## ENVIRONMENTAL IMPACT

The spills summarized in this report involve a wide range of materials, quantities, and circumstances, all of which can contribute to the impact of the spill on the environment. In order to provide some measure of the seriousness of a spill, the Ministry documents the likelihood of an environmental impact resulting from each spill.

In 1994, an environmental impact was confirmed for 18 percent of all spills, 49 percent had possible environmental impacts, and the remaining 33 percent did not have anticipated environmental impacts. *Table 5* summarizes the likelihood of impact for the spills where a confirmed or possible impact was identified; this information is illustrated in *Figure 5*.

**TABLE 5**  
**Nature of Environmental Impact**

IMPACT	CONFIRMED	POSSIBLE
Soil Contamination	582	1 031
Water Pollution	146	841
Air Pollution	39	244
Multi-Media Pollution	59	197
Vegetation Damage	9	8
Human Health/Safety	8	31
Injury to Wild Life	8	4
Other Impact	41	80
<b>TOTAL</b>	<b>892</b>	<b>2 436</b>

The environmental impact data field is not an accurate indicator of the full extent of the impact. For example, a spill that has a confirmed soil contamination impact may involve a spill of a small volume of material, necessitating the removal of a few shovels-full of contaminated soil. A spill of a larger volume may involve the removal of several hundred cubic metres of contaminated soil, however the impact for both would be *soil contamination*. The true extent of environmental impact for individual spills depends on a number of factors, including the volume and type of substance spilled, the location, and the season. Combining the individual impacts of each spill does not provide a realistic measure of the cumulative impacts of all spills on the environment.

*Figure 6* illustrates the environmental impact of spills which had confirmed or possible impacts. The figure shows that the largest confirmed impact was soil contamination. The figure also shows that a significant proportion of spills were identified as having a possible or confirmed water pollution impact. Only a small number of spills posed a threat to human health and safety.

Figure 5  
Environmental Impact

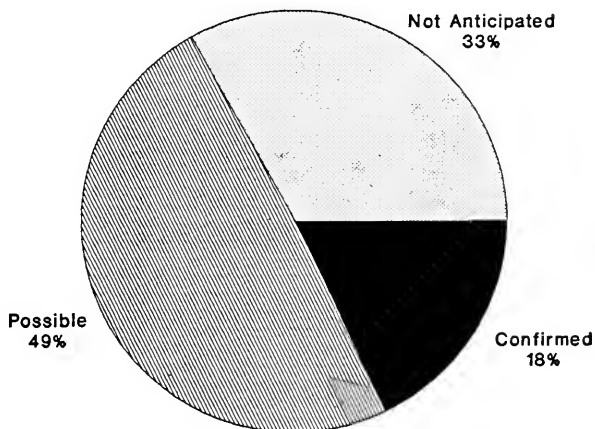
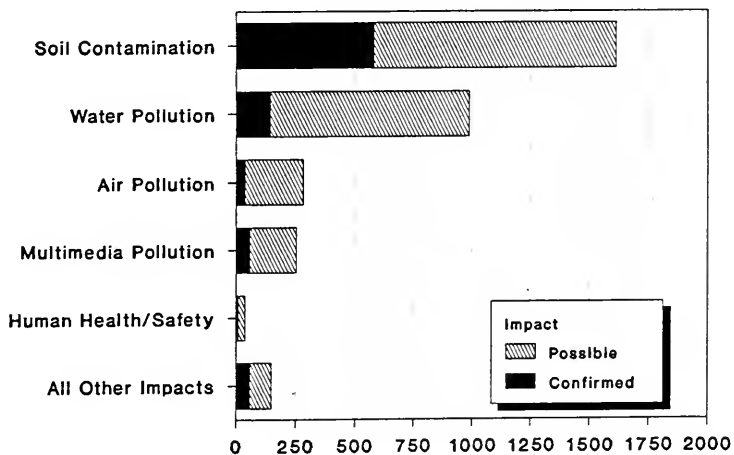


Figure 6  
Nature of Environmental Impact



## SPILL CLEANUP

Part X of the Environmental Protection Act requires that spills be cleaned up promptly and to the extent practicable. It places the primary cleanup responsibility on the discharger; that is, the person who owned and/or had control of the pollutant immediately prior to the spill. In most cases, spills are cleaned up by the person responsible for the discharge, or a contractor hired by them. Part X establishes the right for municipalities to respond to spills. Municipal authorities often do clean up spills, particularly if the spill occurs on municipal roads or into a municipal drainage system or watercourse.

The average cleanup success rate for the period 1991 to 1993 is summarized in *Table 6* and in *Figures 7* and *8*. The exact figures for 1994 are not available due to a computer coding problem in ORIS. However, based on the information that is available, the cleanup success rate does not appear to have changed significantly in 1994.

The success of cleanup efforts is dependent upon a number of factors, including the properties of the spilled material, the accessibility of the spill site, the availability of expertise and resources, and the time required to mobilize a response. Environmental factors play a role as well, since weather and light conditions, and the type of soil or watercourse affected can further complicate or aid the success of the cleanup. Typically, spills to land have a much higher cleanup success rate than do spills to surface waters. Most spills to air are normally impossible to clean up because they usually involve gaseous materials.

**TABLE 6**  
**Spill Cleanup 1991-1993**

YEAR	CLEANUP		
	None	Partial	Full
1991	1 828	804	2 377
1992	1 614	1 084	2 165
1993	1 751	1 083	2 007
<b>3-Year Average</b>	<b>35%</b>	<b>20%</b>	<b>45%</b>

Figure 7  
Spill Cleanup

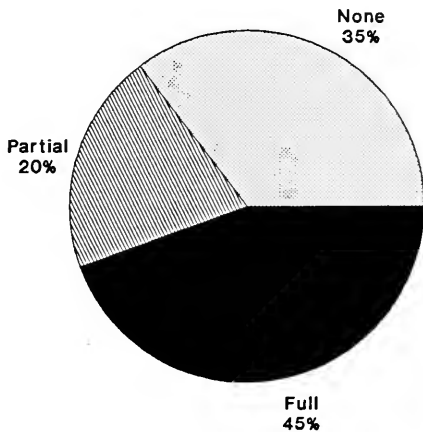
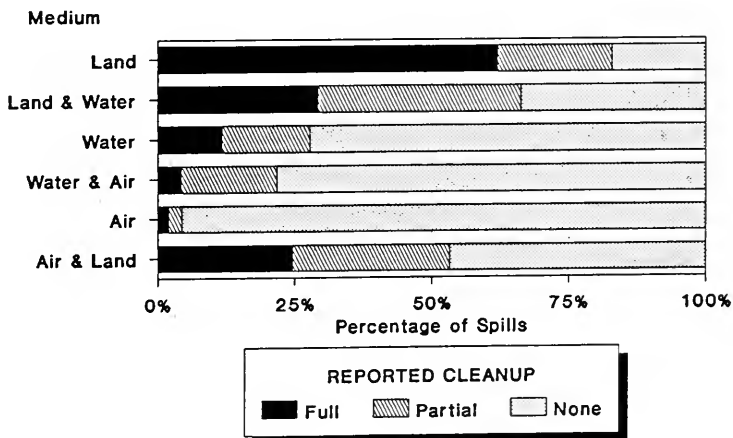


Figure 8  
Spill Cleanup By Medium



Average Cleanup Success  
1991 to 1993

## SPILLS BY SECTOR AND SOURCE

Several years ago, the Canadian Department of Environment developed a computerized database called the *National Analysis of Trends in Emergencies System* (NATES). Like ORIS, this system uses a number of coded fields to classify environmental reports, thereby enabling the storage and analysis of information pertaining to spills. The MOEE adopted some of these codes for use with ORIS to ensure that different government agencies in Canada could exchange information easily.

Each occurrence documented by the MOEE uses the NATES codes to classify the sector and source responsible for the discharge. In addition, ORIS uses Standard Industrial Classification (SIC) codes to provide more detailed descriptions of the sector. Together, these three codes are used to analyze the sectors and sources responsible for spills to the environment.

### Spills By Sector

The industrial sectors with the largest numbers of reported spills in 1994 were transportation<sup>3</sup>, petroleum, chemical, metallurgical, and general manufacturing sectors. Collectively, spills from these five sectors accounted for nearly 44 percent of all spills reported in 1994. Electric utilities, sewage utilities and private residents accounted for the majority of non-industrial sector spills. *Figure 9* summarizes spills by the various industrial and service sectors. *Table 7* lists the number of spills for these sectors over the past 7 years.

**TABLE 7**  
**Spills By Sector – 1988 to 1994**

SECTOR	YEAR						
	1994	1993	1992	1991	1990	1989	1988
Transportation	876	846	801	776	834	726	467
Electric Utilities	547	502	601	711	525	566	508
Petroleum	509	491	632	700	712	654	561
Sewage Utilities	342	248	282	248	296	250	198
Metallurgical	325	271	281	414	476	504	460
General Manufacturing	276	263	264	342	394	446	319
Chemical	223	279	261	343	492	454	334
All Others (Combined)	1 909	1 941	1 892	1 703	1 957	1 745	1 225

When combined, the spills of the seven sectors identified in *Table 7* account for 62 percent of all spills reported in 1994. The chemical sector had a significant reduction in the number of spills reported during 1994; the number of spills for each of the other sectors increased slightly.

<sup>3</sup> The transportation sector includes companies and individuals whose *only* business is providing transportation services. Included in the total number of spills for other sectors (e.g. petroleum, chemical) are the discharges from vehicles owned and operated by them, even though they do involve a mode of transportation.



Figure 9  
Spills By Sector

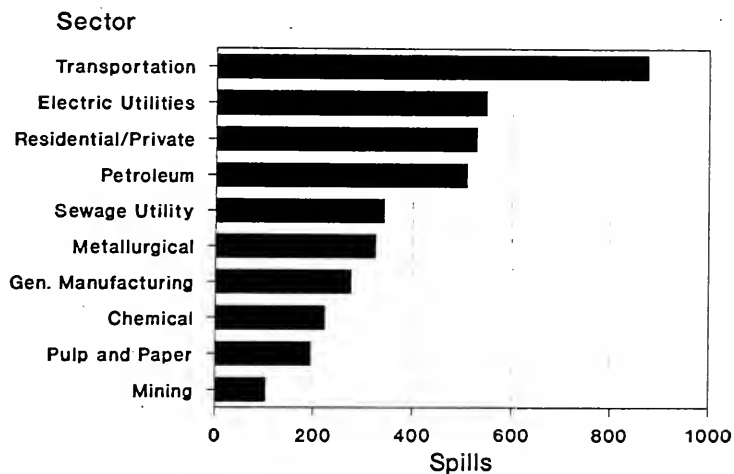
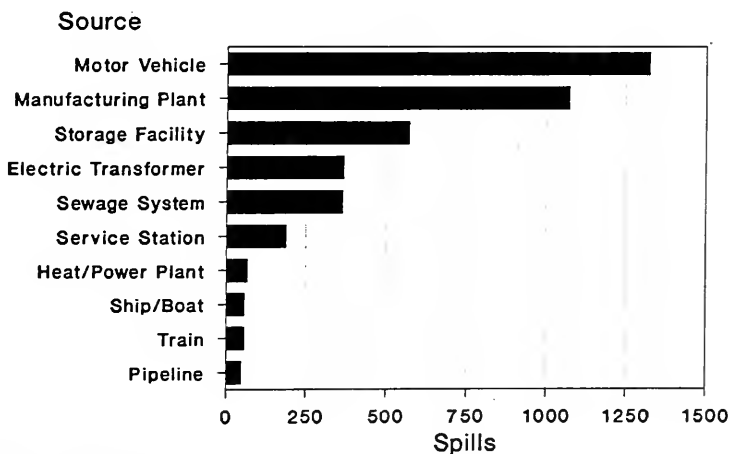


Figure 10  
Spills By Source



Sector and Source were unknown for 362 spills.

## Spills By Source

The source categories with the largest number of reported spills were motor vehicle, manufacturing plant or factory, storage facility, electric transformer, sewage system, and service station. Together, these six categories accounted for 78 percent of all reported spills. *Table 8* provides a comparison of these sectors' spills from 1988 to 1994. *Figure 10* is a summary of spills arranged by the source of the discharge.

**TABLE 8**  
**Spills By Source – 1988 to 1994**

SOURCE	YEAR						
	1994	1993	1992	1991	1990	1989	1988
Motor Vehicle	1 321	1 457	1 419	1 364	1 412	1 127	718
Manufacturing Plant/Factory	1 072	1 001	968	1 305	1 571	1 572	1 284
Storage Facility	570	477	508	524	659	372	243
Electric Transformer	368	362	393	412	407	334	313
Sewage System	365	278	349	268	307	274	230
Service Station	187	176	218	269	316	263	217
All Others (Combined)	1 124	1 090	1 159	1 095	1 014	1 403	1 067

## Spills By Sector and Source

A summary of the typical combinations of sector and source codes provides additional information. There are a possible 238 sector and source code combinations, of which 13 combinations account for 63 percent of all spills. By adding the spills which involve motor vehicles, storage facilities and manufacturing plants, 76 percent of all spills are accounted for. *Table 9* lists the major combinations of source and sector codes used in 1994<sup>4</sup>.

**TABLE 9**  
**Spills By Sector and Source**

SECTOR	SOURCE	SPILLS	PERCENTAGE
Transportation	Motor Vehicle	726	14.5
Electric Utilities	Transformer	353	7.1
Sewage Utilities	Sewage System	306	6.1
Metallurgical	Manufacturing Plant	290	5.8
Residential	Storage Facility	249	5.0
General Manufacturing	Manufacturing Plant	243	4.9
Chemical	Manufacturing Plant	200	4.0
Pulp & Paper	Manufacturing Plant	183	3.7
Petroleum	Service Station	168	3.4
Residential	Motor Vehicle	152	3.1
Petroleum	Motor Vehicle	113	2.3
Petroleum	Storage Facility	104	2.1
Electric Utilities	Motor Vehicle	81	1.6
All Other Sectors (Combined)	Motor Vehicle	249	5.0
All Other Sectors (Combined)	Storage Facility	217	4.3
All Other Sectors (Combined)	Manufacturing Plant	156	3.1

<sup>4</sup> Refer to Appendix III for a complete table of all the sector and source combinations.

The highlights of the combined sector and source data presented in *Table 9* are:

- The *transportation-motor vehicle* combination accounted for 15 percent of all spills. These include spills of cargo and operating fluids, primarily from tankers and transport trucks. In total, spills from the motor vehicles accounted for 26 percent of all spills.
- If the spills at *chemical, petroleum, metallurgical, and pulp and paper manufacturing plants* are combined, they account for 18 percent of all spills.
- The *electric utility-transformer* combination accounted for 7 percent of all spills. Typically, these spills involve small amounts of oil spilled when transformers fail or are accidentally ruptured. Cleanup of these spills is a routine matter for most utilities.
- The *sewage utilities-sewage systems* combination accounted for 6 percent of all spills. These spills include sewage bypasses caused by equipment failure at sewage plants and pumping stations, and breaks in sewage forcemains.
- There were 249 spills from *residential-storage facilities* representing 5 percent of all spills. This combination includes spills of furnace oil from residential storage tanks.
- There were 168 spills involving the *petroleum-service station* combination. An additional 104 spills occurred at *petroleum-storage depots*. The service stations are typically retail outlets for vehicle fuels, while the storage depots are usually privately operated sites where fuels are stored in bulk quantities. Spills at these sites typically involve leaks of petroleum products from storage tanks, fuel draining from hoses, and overflows that occur while vehicle tanks are being filled.

In some cases, the Ministry is unable to determine the source of a spill. Typically, these occurrences involve spills to remote roads, ditches, or watercourses; some of these occurrences involve the illegal dumping of materials. The source and sector was not known for 362 spills (7 percent) reported in 1994.

## SPILLS BY CAUSE AND REASON

ORIS uses the NATES codes as a basis for summarizing the cause and reason for each spill. The "cause" describes how a spill occurred and the "reason" clarifies the cause by identifying the primary contributing factor. For example, a typical combination is *transportation accident* (cause) due to *adverse road conditions* (reason).

Table 10 summarizes the major cause codes for spills reported in 1994. Together, these eight codes account for 83 percent of all spills. Figure 11 illustrates the major causes attributed to spills in 1994. Container leaks, pipe or hose leaks, and container overflows caused nearly half of all spills.

**TABLE 10**  
**Spills By Cause – 1988 to 1994**

CAUSE	YEAR						
	1994	1993	1992	1991	1990	1989	1988
Pipe or Hose Leak	951	1 120	996	974	803	595	291
Container Leak (NOS)	930	949	1 025	1 002	1 109	712	472
Container Overflow	449	399	390	533	672	492	455
Valve or Fitting Leak	444	336	370	431	419	407	319
Cooling System Leak	373	398	453	464	441	387	260
Motor Vehicle Accident	336	345	339	306	338	428	394
Storage Tank Leak	333	359	377	369	388	330	237
Wastewater Discharge	361	250	317	346	387	547	361

Table 11 summarizes the most frequently reported reasons for spills in 1994. Together, these six codes account for 64 percent of all spills. Figure 11 illustrates the major causes attributed to spills in 1994. Operator error and equipment failure were the major reasons for spills. These values are generally consistent with those presented in previous years. This suggests that spills can be prevented through proper staff training and regular equipment maintenance.

**TABLE 11**  
**Spills By Reason – 1988 to 1994**

REASON	YEAR						
	1994	1993	1992	1991	1990	1989	1988
Operator Error	1 078	1058	1 172	1 343	985	760	533
Equipment Failure	1 064	1121	1 235	1 124	1 327	1 028	892
Container Failure	698	721	576	743	794	671	334
Storm or Flood	127	136	178	124	145	84	107
Damage By Equipment	119	160	148	210	239	199	44
Intentional/Planned	101	128	107	127	190	208	120

Figure 11  
Spills By Cause

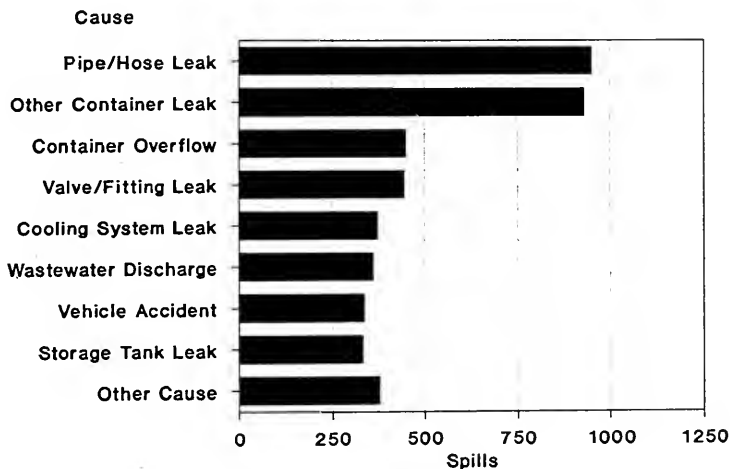
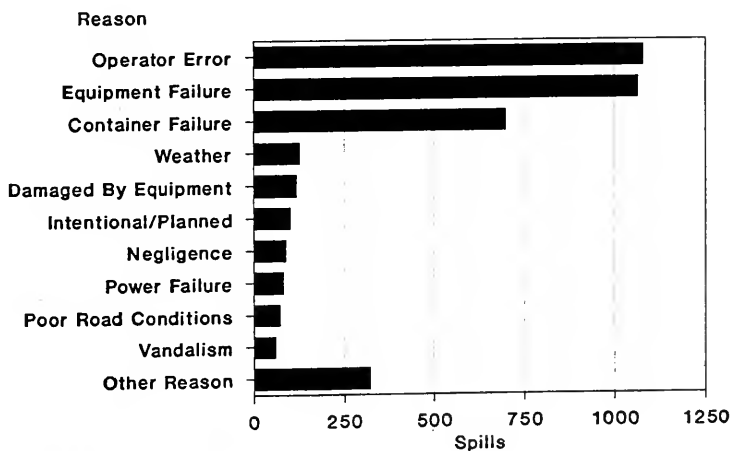


Figure 12  
Spills By Reason



The Cause and Reason were unknown for 452 Spills.

On each occurrence report, the cause and reason codes are used together to indicate why and how a spill occurred. An examination of the cause and reason codes used in 1994 reveals that, of a possible 506 combinations, eleven accounted for nearly half of all occurrences. *Table 12* summarizes these combinations<sup>5</sup>.

**TABLE 12**  
**Spills By Cause and Reason**

CAUSE	REASON	SPILLS
Pipe or Hose Leak	Equipment Failure	346
Other Container Leak	Error	266
Container Overflow	Error	238
Pipe or Hose Leak	Container Failure	237
Motor Vehicle Accident	Error	186
Valve or Fitting Leak	Equipment Failure	183
Pipe or Hose Leak	Error	150
Storage Tank Leak	Container Failure	128
Other Container Leak	Container Failure	128
Cooling System Leak	Equipment Failure	114
Other Container Leak	Equipment Failure	108

<sup>5</sup> Refer to Appendix IV for a complete table of all the cause and reason combinations.

## SPILLS TO THE GREAT LAKES SYSTEM

The Great Lakes are a vital component of Ontario's ecosystem. They contain about 20 percent of the world's fresh water. This section of the report focuses on oils and chemicals that spilled directly to the waters of the Great Lakes system. Although spills constitute a small fraction of total pollution loadings to the Great Lakes, the immediate impact of some spills can have a significant local impact. Shore-based facilities, ships and effluent pipes are all potential discharge points for contaminants.

In 1994, there were 164 spills of oils and chemicals (including chemical solutions) to the Great Lakes system, 2 more than in 1993. *Figure 13* shows the number of spills to each of the Great Lakes, and their connecting channels, for 1994; *Table 13* summarizes these spills by watercourse and sector.

**TABLE 13**  
**Spills of Oils and Chemicals to the Great Lakes**

SECTOR	WATERCOURSE										TOTAL
	Lake Superior	St. Marys River	Lake Huron	St. Clair River	Detroit River	Lake Erie	Niagara River	Welland Canal	Lake Ontario	St. Lawrence River	
Chemical				9					1	2	12
General Mfg.			1	2				2	3	1	9
Government			1			1			1		3
Electric Utilities			5	1		2	2		10		20
Metallurgical		1			1				12		14
Petroleum			2	3		2			3		10
Pulp & Paper	8							1		19	28
Residential			4		1	1		1	4	1	12
Retail				1							1
Service		1							2		3
Sewage Utilities			2						2		4
Transportation	1	1	4	4	3	6		3	3		25
Other				1		1			2		4
Unknown	1	1	3	1	1	3			8	1	19
<b>TOTAL</b>	<b>10</b>	<b>4</b>	<b>22</b>	<b>22</b>	<b>6</b>	<b>16</b>	<b>2</b>	<b>7</b>	<b>51</b>	<b>24</b>	<b>164</b>

*Table 14* and *Figure 14* summarize the total number of materials spilled in the oil and chemical groupings. *Figure 14* reflects the number of oil and chemical spills to the Great Lakes in volume groups. Of the spills where the volume was reported, 84 percent involved volumes less than 1 000 litres.

Figure 13  
Spills of Oils and Chemicals  
to the Great Lakes

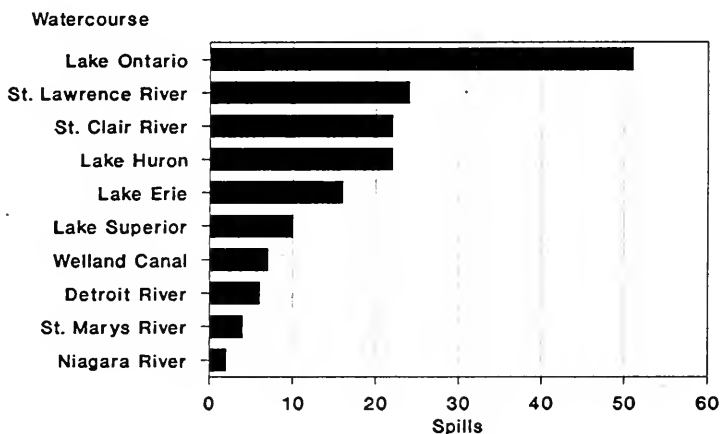
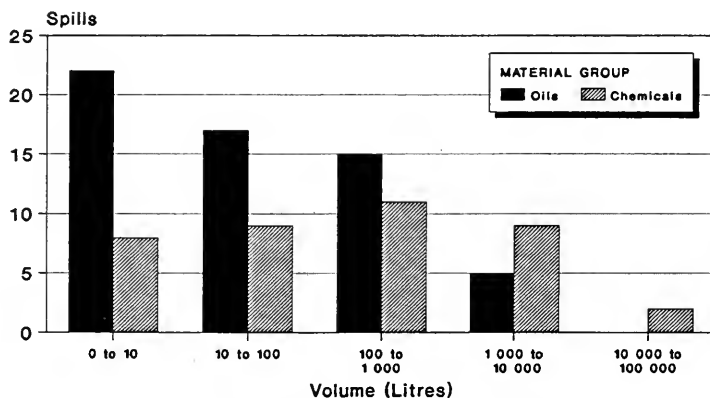


Figure 14  
Great Lakes Spill Volumes  
By Material Type



Volume was known for 98 of 169 (58%)  
Spills to the Great Lakes System  
Involving Oils and Chemicals



**TABLE 14**  
**Spills of Oils and Chemicals to the Great Lakes by Volume Spilled**

MATERIAL & VOLUME (L)		WATERCOURSE										TOTAL
		Lake Superior	St. Marys River	Lake Huron	St. Clair River	Detroit River	Lake Erie	Niagara River	Welland Canal	Lake Ontario	St. Lawrence River	
OILS (O, I, L, S)	Unknown	1	2	9	1	2	6		3	16	2	42
	0-10		1	5	5	2	4			5		22
	10-100	1		3			3	1	2	6	1	17
	100-1 000			1	1	1	1	1		8	2	15
	1 000-10 000				2					2	1	5
	10 000-100 000											0
CHEMICALS (C, H, E, M, I, C, A, L)	Unknown	1	1	2	10		2		2	5	6	29
	0-10			2	5						1	8
	10-100	1			2					4	2	9
	100-1 000	4								2	5	11
	1 000-10 000	2								3	4	9
	10 000-100 000									1	1	2
TOTAL		10	4	22	26	5	16	2	7	52	25	169

Note: the 169 spilled materials summarized in Table 14 were the result of the 164 spill events shown in Table 13. i.e., Five of the 162 reported spills involved two spilled materials.

### Lake Superior

There were 10 spills of oils and chemicals to Lake Superior in 1994. Four-fifths of these were from operations of the pulp and paper sector.

### St. Marys River

There were 4 spills of oils and chemicals to St. Marys River in 1994, one each from metallurgical sector operations, transportation sector, services sector, and one where the sector was not determined.

### Lake Huron and Georgian Bay

There were 22 spills of oils and chemicals to Lake Huron and Georgian Bay in 1994. Five were from electric utility operations and four were from transportation sector sources.

### St. Clair River, Lake St. Clair and Detroit River

There were 28 spills of oils and chemicals to these waters in 1994. Nine spills occurred at chemical sector sites, three were from petroleum sector operations, two spills were from general manufacturing operations, and seven were from transportation sector sources.

**Lake Erie**

There were 16 spills of oils and chemicals to Lake Erie in 1994. Six were from transportation sector sources, two were from petroleum sector operations, and two were from electric utilities' operations.

**Niagara River and Welland Canal**

There were nine spills of oils and chemicals to these watercourses in 1994, including two from general manufacturing operations, two from electric utilities' operations, and three from transportation sector sources.

**Lake Ontario**

There were 51 spills of oils and chemicals to Lake Ontario in 1994. This included twelve spills from metallurgical sector operations, ten spills from electric utilities, nine from general manufacturing sector sources, four from private or residential sources (mainly watercraft), and three from transportation sector sources.

**St. Lawrence River**

There were 24 spills of oils and chemicals to the St. Lawrence River in 1994. Nineteen spills were from pulp and paper facilities, and two were from chemical sector facilities.

## PLANNING FOR SPILL CONTINGENCIES

The Ministry of Environment and Energy is actively involved in planning for spill contingencies. The Ministry's Contingency Planning Program provides advice and assistance to industry, government agencies, and others who may have, or respond to, environmental spills. Industries are encouraged to develop spill contingency plans in order to prepare themselves for the eventuality of a spill. In some instances however, the resources of the discharger may be insufficient to deal with a major spill. Several contingency plans are in place to provide a mechanism to deal with such spills when they occur, and these are outlined below.

### The Canada/United States Water Quality Agreement

Under the *Canada/United States Water Quality Agreement* signed by the Prime Minister of Canada and the President of the United States, the two countries agreed to establish mechanisms to deal with spills, pollution monitoring and pollution abatement in waters shared by the two countries. The Agreement calls for a joint contingency plan which organizes the national, provincial/state, and local resources to deal with spills.

### The Canada/United States Joint Marine Pollution Contingency Plan

The *Joint Canada/United States Marine Pollution Contingency Plan* establishes the mechanism, as required by the Canada/United States Water Quality Agreement, under which both countries will respond to spills which affect or may affect the other. This plan depends on supporting plans at the federal, provincial/state, and municipal levels. Under this plan, the coast guard of the country in which the spill originates is in charge and MOEE, through the Province of Ontario Spill Contingency Plan, acts in a support role and gives advice on environmental matters. The Ministry's field support is provided through the Regional offices and MOEE's executive support on the International Joint Response Team is provided by the Spills Action Centre. This team is made up of representatives of the responding agencies from both countries and provides an advisory service to the coast guard in charge.

### The Canadian Marine Contingency Plan

The *Canadian Marine Contingency Plan* deals with spills from vessels in navigable waters which do not cross the international border. The Canadian Coast Guard is in charge under this plan. Under this plan, MOEE again provides a support and advisory role similar to that outlined under the Joint Plan.

### The Province of Ontario Contingency Plan For Spills of Oil and other Hazardous Materials

The *Province of Ontario Contingency Plan for Spills of Oil and Hazardous Materials* establishes a reporting and notification protocol for all spills and to provide a mechanism to deal with major spills under provincial jurisdiction which threaten the environment. It also provides the mechanism through which provincial efforts are coordinated under the contingency plans discussed above. The Plan deals with the containment, clean-up, and disposal phases of spills and is subordinate to plans which deal with

contingencies where the threat to life and property is of primary concern. For major spills within MOEE's mandate, the Plan places MOEE in charge and works with the Ministries of Natural Resources, Northern Development and Mines, Health, Labour, Solicitor General and Correctional Services, Consumer and Commercial Relations, and Transportation. Two federal agencies, Environment Canada and the Canadian Coast Guard, are also signatories. The Plan relies on a response team concept, consisting of representatives of the participating agencies.

## **The Province of Ontario Nuclear Plan**

The *Province of Ontario Nuclear Plan* is designed to coordinate the response to major events involving nuclear generating facilities. The Plan establishes several groups and organizations in which MOEE participates. MOEE's role includes sampling under the direction of the Ministry of Labour, participation on the Provincial Ingestion Monitoring Control Group, and the Provincial Restoration Committee established under the Plan.

## **The Canada-Ontario Agreement (COA) Spill Reduction Commitment**

Under the *Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (1994)*, federal and provincial governments jointly initiated a spill reduction commitment. This commitment focuses on the prevention and control of spills by improving federal and provincial spill prevention, preparedness, and response programs in priority areas (such as the St. Clair River) in order to reduce pollutant loadings. Five educational workshops are planned for industrial and municipal groups in the priority areas to promote awareness of the environmental consequences of spills.

The Ministry is also investigating the feasibility of a one-window approach to federal and provincial spill reporting, as well as a framework for ensuring coordinated and cooperative spill preparedness and response throughout Ontario. This would include Regional Environmental Emergency Teams comprised of federal, provincial, industrial representatives, and other local experts as required.

## **MOEE's Contingency Planning Office**

The Ministry encourages those companies and individuals to assess their operations and minimize the potential for spills. Assistance in this regard is available through the Ministry's Contingency Planning Office at (416) 325-3000.

APPENDIX I

**SAMPLE OCCURRENCE REPORT**



Received by		ORIS No.		IEB No.	
Type of Occurrence <input type="checkbox"/> Occurrence Code      Sub. Cat. Code      Work Plan Program				Occurrence Date YY MM DD	
Reported by (Name/Organization)				Date Reported YY MM DD	
Tel. No.		Alternate Tel. No.		Date MOE at Scene YY MM DD	
Address				Time (24 Hr. Clock) : Time (24 Hr. Clock) : Time (24 Hr. Clock) :	
Postal Code				Assigned To: Person/Program	
Location of Occurrence			4. Source (Name of company/person, Process Area, Address)		
MOE Region Code      MOE Dist. Code      Municipal Code      Sector Code      Source Code      SIC Code					
Synopsis (75 Characters Maximum)					
Summary (Attachments accompanying this report: If Yes <input type="checkbox"/> number and list them in this section)					
Multiple reports on single incident: If <input type="checkbox"/> Yes, record initial/master regional number here >>					
Continued <input type="checkbox"/> Yes					
7. Follow-up Action <input type="checkbox"/> Abatement <input type="checkbox"/> I.E.B. <input type="checkbox"/> Other      (Section Code)      B. F. Date YY MM DD					
File Closed: <input type="checkbox"/> Abatement <input type="checkbox"/> IEB <input type="checkbox"/> Other      Complainant Contacted      CON CAT CNR      YY MM DD      Suspected Violation Code					
Report prepared by		Completion Date YY MM DD		IEB, Investigator Assigned	
Print/Initial		Date		IEB, B. F. Date YY MM DD	
Approving Officer		YY MM DD		IEB Supervisor	
Print/Initial		Date		YY MM DD	

Specify number(s), indicating the routing of the original

Specify number(s), indicating the distribution of the copies

- ☐ 1 Investigator or Environmental Officer     
 ☐ 2 District Officer/File     
 ☐ 3 SAC (all spills)     
 ☐ 4 Reg. Dir./Mgr.     
 ☐ 5 IEB Reg. Supervisor     
 ☐ 6 IEB Head Office/File     
 ☐ 7 Other

Complete appropriate boxes in this section if this page is used

ORIS No.

I.E.B. No. \_\_\_\_\_

Page of

## Initial Occurrence Report

Continued on  
**Continuation  
Page** ☐ Yes



APPENDIX II

**SECTOR AND SOURCE MATRIX**



## ORIS SECTOR AND SOURCE CODES

Description of the ORIS Sector and Source Codes are provided below to help explain the categories used in Table III.1

### **SECTOR DESCRIPTIONS**

<b>Chemical</b>	-	manufacturers of basic chemicals or feed stocks (including derivative products)
<b>Food Processing</b>	-	food processing operations (not including distribution and retail operations)
<b>Metallurgical</b>	-	primary refiners of metal ore and scrap metal
<b>Mining</b>	-	mining operations (aggregate pit operators, ore mining, etc.)
<b>Petroleum</b>	-	manufacturers and retailers of petroleum products
<b>Pulp &amp; Paper</b>	-	processors of wood pulp and manufacturers of paper products
<b>Other Manufacturing</b>	-	manufacturing operations that are not included in any of the more specific manufacturing sectors
<b>Agriculture</b>	-	all farming operations including co-ops, farms, and ranches
<b>Construction</b>	-	construction companies, builders, and contractors
<b>Hydro Utilities</b>	-	utilities which provide electricity to consumers
<b>Sewage Utilities</b>	-	utilities which operate sewage systems
<b>Government</b>	-	administrative and other government operations not otherwise specified
<b>Retail</b>	-	stores which sell products to consumers
<b>Services</b>	-	companies/individuals who provide a services as opposed to a product (e.g. dry cleaners, hotels/motels, etc)
<b>Transportation</b>	-	companies/individuals whose <u>only</u> business is providing transportation services
<b>Residential/Private</b>	-	private citizens

### **SOURCE DESCRIPTIONS**

<b>Aircraft</b>	-	all airborne modes of transport
<b>Marine Tanker/Carrier</b>	-	waterborne carriers of bulk cargo
<b>Other Watercraft</b>	-	other waterborne modes of transport (i.e. ferries, motor boats, etc.)
<b>Train</b>	-	vehicles which run exclusively on rails
<b>Motor Vehicle</b>	-	automobiles, trucks, motorcycles, etc.
<b>Pipeline</b>	-	bulk transport lines (excluding "in-plant" piping networks)
<b>Service Station</b>	-	all vehicle servicing facilities (gas stations, marinas)
<b>Storage Facility</b>	-	includes all types of storage facilities, both private and commercial
<b>Heat/Power Station</b>	-	electrical generating stations (thermal, nuclear and hydroelectric)
<b>Manufacturing Plant</b>	-	all manufacturing and processing facilities
<b>Sewage System</b>	-	municipal/industrial waste water collection systems (including residential septic systems)
<b>Electric Transformer</b>	-	electrical transformers, capacitors, etc.
<b>Water Supply</b>	-	municipal water distribution systems

Note that vehicles operated by sectors other than transportation (see definition above) are defined as belonging to the sector that operates them. Spills from such vehicles are included in the totals for that specific sector, not the transportation sector.

**Spills By  
Sector and Source**

SECTOR	SOURCE														TOTAL
	Aircraft	Marine Tanker/Carrier	Other Watercraft	Train	Motor Vehicle	Pipeline	Service Station	Storage Facility	Heat/Power Plant	Manufacturing Plant	Sewage System	Transformer	Water Supply	Other	
Agriculture					13			17		1				20	51
Chemical					12			4		200				7	223
Construction					37			4			1			64	106
Food					22		1	7		66	2			2	100
Government	1		1		35		5	21			3	2	1	79	148
General Mfg.					6			13		243	1	1		12	276
Electric Utilities			1		81			15	60			353		37	547
Metallurgical					8			4		290	16	1		6	325
Mining					7			10		32	2			52	103
Petroleum		2	7		113	48	168	104		55				12	509
Pulp & Paper				2	10					183					195
Residential	2		22		152			249			16	11	3	73	528
Retail					15			64			16			26	121
Service					64		6	18	3		1			71	163
Sewage Utilities					3						306		33		342
Transportation	7	8	16	47	726		7	39			1			25	876
Other				7	17			1	2	2				3	32
TOTAL	10	10	47	56	1321	48	187	570	65	1072	365	368	37	489	4645

The Source and Sector Information was not known for 362 spills.

APPENDIX III

**CAUSE AND REASON MATRIX**



## ORIS CAUSE AND REASON CODES

Descriptions of the ORIS Cause and Reason Codes are provided below to help explain the categories used in Table IV.1.

### **CAUSE DESCRIPTIONS**

<b>Watercraft Accident</b>	- collision, grounding or sinking of ships, barges, pleasure craft, etc.
<b>Derailment</b>	- accidents where railcars or locomotives leave the rails
<b>Aircraft Crash</b>	- accidents involving aircraft
<b>Motor Vehicle Accident</b>	- road vehicle accidents, truck/trailer overturns
<b>Container Overflow</b>	- overfilling of storage tanks, vehicle fuel/cargo tanks, lagoons, etc.
<b>Pipe/Hose Leak</b>	- discharges from pipes and hoses (other than cooling systems)
<b>Valve/Fitting Leak</b>	- leaks from specific components of equipment, containers and pipelines
<b>Storage Tank Leak</b>	- discharges from stationary above-ground and below-ground storage tanks
<b>Cooling System Leak</b>	- discharges from electricity transformers and capacitors, vehicle radiators, nuclear reactors
<b>Dyke Failure</b>	- failure of storage pond or lagoon walls
<b>Other Container Leak</b>	- spills from containers other than those specified above
<b>Wastewater Discharge</b>	- accidental or unusual variation of wastewater discharges to watercourses from manufacturing/processing facilities, generating stations and sewage plants
<b>Process Start/Stop</b>	- emissions resulting from a change in operating conditions
<b>Process Upset</b>	- an unusual variation in the <i>regular</i> discharge of a contaminant to air due to a fluctuation in the process
<b>Unknown</b>	- cause not determined
<b>Other</b>	- cause not otherwise specified

### **REASON CODE DESCRIPTIONS**

<b>Intentional/Planned</b>	- intentional or planned release
<b>Error</b>	- releases due to mistakes by humans
<b>Vandalism</b>	- illegal/deliberate releases (including sabotage)
<b>Ice/Frost Damage</b>	- freezing, frost heave, the weight of snow or ice, or falling ice
<b>Power Failure</b>	- loss of electrical power
<b>Fire/Explosion</b>	- fires or explosions ( <i>not</i> releases that <i>cause</i> a fire or explosion)
<b>Storm/Flood</b>	- storms, floods, lightning, wind, etc.
<b>Equipment Failure</b>	- malfunctions in system components
<b>Container Failure</b>	- corrosion, overpressure, material failure, failure of welds or seams
<b>Damage by Moving Equipment</b>	- containers damaged by vehicles
<b>Gasket/Joint</b>	- failure of any point of connection
<b>Apparent Negligence</b>	- releases due to a lack of diligence
<b>Adverse Road Condition</b>	- road faults, rain, ice or snow, debris on road
<b>Unknown</b>	- reason not determined
<b>Other</b>	- reason not otherwise specified

**Spills By  
Cause and Reason**

CAUSE	REASON														TOTAL
	Intentional/Planned	Error	Vandalism	Ice/Frost Damage	Power Failure	Fire/Explosion	Storm/Flood	Equipment Failure	Container Failure	Damage By Moving Equipment	Adverse Road Condition	Apparent Negligence	Unknown	Other	
Watercraft Accident	1	1		1		1			1			1	10	3	19
Derrailment		4						1					5		10
Aircraft Crash		5						1					6	2	14
Motor Vehicle Accident		186				5		11	9	9	35	6	66	9	336
Overflow		238	2	6	16	2	12	83	9			11	46	24	449
Pipe/Hose Leak	4	150	11	25		4	1	346	237	22	8	5	116	22	951
Valve/Fitting Leak	1	75	4	6		2	1	183	98	8	2		58	6	444
Storage Tank Leak		34	7	3	2	1	2	43	128	9		6	87	11	333
Cooling System Leak	1	39	5	1	2	16	58	114	66	27		1	32	11	373
Dyke Failure	1			1									4	7	13
Other Container Leak	24	266	23	3	2	22	6	108	128	44	27	29	203	45	930
Wastewater Discharge	24	34	2	4	50	2	35	106	11			7	67	19	361
Process Upset		8			4	3	4	46	6				9	15	96
Process Start/Stop	9	5			4			11	2				9	3	43
Other	36	33	5		2	22	8	12	3			22	26	15	184
TOTAL	101	1078	59	50	82	80	127	1065	698	119	72	88	744	192	4555

The Cause and Reason Information was not known for 452 spills.



APPENDIX IV

**DEFINITIONS AND  
REPORTING EXEMPTIONS**



## **EPA Spill Definition**

The following sections are taken from the Ontario Environmental Protection Act (RSO 1990). They are included in order to help the reader understand the legal definition of a spill under Part X of the Act.

- Sec. 91(1)      **"spill"**, when used with reference to a pollutant, means a discharge,  
                    (a) into the natural environment,  
                    (b) from or out of a structure, vehicle, or other container, and,  
                    (c) is abnormal in quantity or quality in light of all the circumstances of the discharge;
- Sec. 1(1)      **"natural environment"** means the air, land and water, or any combination or part thereof, of the province of Ontario;
- Sec. 1(1)      **"air"** means open air not enclosed in a building, chimney or flue;  
  
                    **"land"** means surface land not enclosed in a building, land covered by water and all subsoil, or any combination or part thereof;  
  
                    **"water"** means surface water or ground water, or either of them;
- Sec. 1(1)      **"contaminant"** means any solid, liquid, gas, odour, heat, sound, vibration, radiation or combination of them resulting directly or indirectly from human activities that may cause an adverse effect;
- Sec. 91(1)      **"pollutant"** means a contaminant other than heat, sound, vibration, or radiation, and includes any substance from which a pollutant is derived;
- Sec. 1(1)      **"adverse effect"** means one or more of,  
                    (a) impairment of the natural environment for any use that can be made of it,  
                    (b) injury or damage to property or to plant or animal life,  
                    (c) harm or material discomfort to any person,  
                    (d) an adverse effect on the health of any person,  
                    (e) impairment of the safety of any person,  
                    (f) rendering any property or plant or animal life unfit for use by humans,  
                    (g) loss of enjoyment of normal use of property,  
                    (h) interference with the normal conduct of business;
- Sec. 2            A contaminant that is discharged into the air within a building or structure as a result of the discharge of the same or another contaminant in another building or structure shall be deemed to be discharged into the natural environment by the owner or the person who has the charge, management or control of the contaminant discharged in another building or structure;

Every person having control of a pollutant that is spilled and every person who spills or causes or permits a spill of a pollutant that causes or is likely to cause an adverse effect must notify forthwith,

- (1) the Ministry,
- (2) the municipality within the boundaries of which the spill occurred,
- (3) the owner of the pollutant and,
- (4) the controller of the pollutant.

The owner and the person having control of the pollutant must do everything practicable to clean up the spill and restore the natural environment. If they fail to do so, the municipality may perform the clean up.

Failing that, the Minister of Environment and Energy may issue a Minister's direction to employees of the ministry or their agents under section 94 of the Act, or order nearly anybody (including the discharger) to take immediate action to stop, contain, and cleanup the spill.

### ***Incidents exempt from Part X of the Environmental Protection Act (the "Spills Bill")***

Several categories of discharges are exempted by Ontario Regulation 360 (RSO 1990) from some or all portions of Part X of the Environmental Protection Act. Other Parts of the Act still apply.

The following incidents are exempt from all requirements of Part X of the Environmental Protection Act:

- Animal wastes disposed of in accordance with normal farming practices;
- Ministry approved air emissions which do not contravene any of the conditions of approval;
- Discharges to water or land, which the ministry has approved, such as from sewage works, waste disposal sites, or the application of pesticides, provided such discharges do not contravene any of the conditions of approvals, licences, or permits;
- Spills of water from reservoirs formed by dams;
- Spills of pollutants from fires equivalent to those from fires of ten or fewer households. This means that many fires are not considered spills, but fires at large commercial or industrial facilities are not exempt from Part X.

### ***Reporting Exemptions***

The following discharges are exempt from the reporting requirements only; cleanup and other provisions of the legislation still apply:

- Planned spills such as would be generated by some industry startup or shutdown procedures and for spill training exercises. This exemption is on condition that a ministry director is notified in advance and consents, and that the release is monitored.
- Spills of less than 100 litres of vehicular operating fuels, lubricants, and coolants from a motor vehicle if the liquids have not entered, and are not likely to enter, any surface water or well (any notification required under the Highway Traffic Act must still be made).
- Water discharges from broken municipal water mains where there is no personal injury and no damage to buildings. These incidents are also exempt from the reporting requirements of Section 14 of the Environmental Protection Act.
- Sewer bypass overflows through approved bypass systems if the bypass was caused by precipitation or runoff.



